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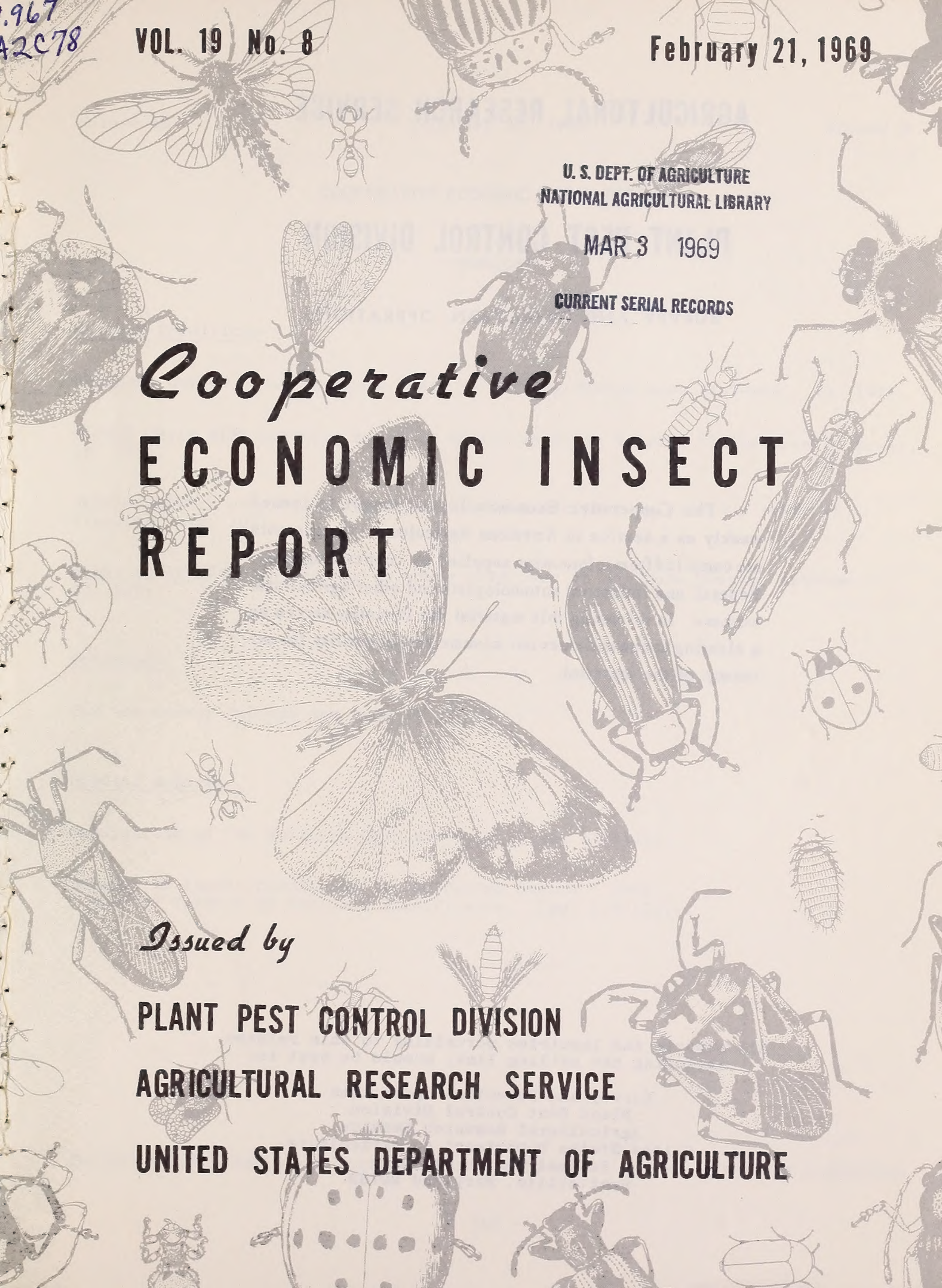

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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United States Department of Agriculture
Federal Center Building
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Volume 19 February 21, 1969 Number 8

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREENBUG damage heavy on small grain in Rolling Plains area of Texas. (p. 107).

WINTER GRAIN MITE activity heavy on winter wheat in Rolling Plains area of Texas. (p. 107).

ALFALFA WEEVIL population expected to be lighter than in previous years in Virginia. (p. 107).

GREEN PEACH APHID increasing on young safflower in Maricopa County, Arizona. (p. 108).

Detection

For new county records see page 111.

Special Reports

Populations of the Northern Corn Rootworm. (pp. 112-113).

Summary of Insect Conditions in the United States - 1968
Special Insects of Regional Significance. (pp. 114-122).

Reports in this issue are for week ending February 14 unless otherwise indicated.

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WEATHER BUREAU'S 30-DAY OUTLOOK

MID-FEBRUARY TO MID-MARCH 1969

The Weather Bureau's 30-day outlook for mid-February to mid-March is for temperatures to average above seasonal normals over the southern Plains and southern and central Rocky Mountain States, as well as over portions of the Northeast and Great Lakes. Below normal temperatures are indicated for the Middle and South Atlantic States, while near normal temperatures are expected elsewhere. Precipitation is expected to exceed normal over the Northwest and most of the South. Subnormal totals are indicated for a band extending from the northern Plains through the Great Lakes to northern New England, while near normal amounts are in prospect elsewhere.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D.C. 20250. Price $5.00 a year.

For Weather of the Week see page 111.

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

ARMY CUTWORM (Chorizagrotis auxiliaris) - OKLAHOMA - Ranged 2-6 per 10 linear feet in 3 of 6 wheatfields in Noble and Kay Counties. (Okla. Coop. Sur.). KANSAS - None found in wheat checked in Barton, Stafford, Edwards, Ford, Meade, Seward, Stevens, Grant, Kearny, Finney, Wichita, Wallace, Logan, Gove, Thomas, Sheridan, and Graham Counties. (Simpson).

BEET LEAFHOPPER (Circulifer tenellus) - CALIFORNIA - Rain and equipment failure hampered spray efforts. To date 10,883 rangeland acres treated, including 2,330 acres this period. Leafhoppers ranged 15-20 per 10 sweeps in Los Banos Hills, Merced County. Weather hampered survey. Egg development not at peak. (Cal. Coop. Rpt.).

GREENBUG (Schizaphis graminum) - KANSAS - None found in wheat checked in Barton, Stafford, Edwards, Ford, Meade, Seward, Stevens, Grant, Kearny, Finney, Wichita, Wallace, Logan, Gove, Thomas, Sheridan, and Graham Counties. (Simpson). OKLAHOMA - Ranged 50-125 per linear foot in wheat in Jackson and Tillman Counties. Occasional fields showing damage. Averaged 5 per linear foot in Perkins area, Payne County. (Okla. Coop. Sur.). TEXAS - Spotted, heavy activity in South Plains, Rolling Plains, and central areas. Heavy damage in Wilbarger, Foard, Wichita, and Motley Counties. Damage lighter in Knox, Haskell, Cottle, King, and Jones Counties. Survey of Hill, Bosque, McLennan, and Limestone Counties revealed spotted, heavy damage in Groesbeck and Mart area on 3 to 6-inch wheat. Ranged 100-200 per row foot in fields near Groesbeck and Mart. Very light in other fields in area. Ranged 5-25 per row foot in Bosque County. Very light, 0-5 per row foot, in other counties. Damage widespread in Lampasas County; control underway in many areas. (Richardson et al.). NEW MEXICO - Ranged 10-20 per row foot in Artesia area, Eddy County, and Roswell, Chaves County. Few fields in Chaves County with 100+ aphids per linear foot. (Mathews).

SPOTTED ALFALFA APHID (Therioaphis maculata) - NEW MEXICO - Generally light and spotty in Eddy and Chaves County alfalfa, but occasional heavy infestation found. Few growers treating in Artesia area, Eddy County. (Mathews).

SMALL GRAINS

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Light, up to 4 per linear foot, in most wheatfields in Noble and Kay Counties. (Okla. Coop. Sur.). TEXAS - Heavy in Wilbarger and Archer Counties. Moderate in Baylor County. (Boring, Feb. 7). Activity heavy on wheat in Wilbarger, Archer, and Baylor Counties. Light in McLennan County; up to 50 per row foot. (Boring, Green).

TURF, PASTURES, RANGELAND

AN ARMORED SCALE (Aonidomytilus bilobis) - CALIFORNIA - Medium on Atriplex sp. in Kettleman City, Kings County. First specimens for California Department of Agriculture collection, but not new record. (Cal. Coop. Rpt.).

FORAGE LEGUMES

ALFALFA WEEVIL (Hypera postica) - MISSISSIPPI - Larvae per 20 stems and adults per 10 square feet by county: Oktibbeha 1, 6; Pontotoc 1, 4; Marshall 1, 3. (Dinkins). VIRGINIA - Samples of overwintering eggs indicate low larval populations in early spring. Overwintering adults low on the Blue Ridge and in the Shenandoah Valley, indicating low spring populations. Overwintering adults numerous in central area. Controls anticipated in eastern areas this spring. Infestations may be later and lighter than in previous years. (Woodside, Hendrick).

EGYPTIAN ALFALFA WEEVIL (*Hypera brunneipennis*) - ARIZONA - Heavy, up to 27 first to fifth instars per plant in 40-acre field of alfalfa on Yuma Mesa, Yuma County; heavy in Somerton area. (Ariz. Coop. Sur., Feb. 5). CALIFORNIA - Probably this species heavy in 40-acre field of alfalfa in Holtville, Imperial County. (Cal. Coop. Rpt.).

CLOVER SEED WEEVIL (*Miccotrogus picirostris*) - MISSOURI - Collected from hop clover at Steeleville, Crawford County, by R.E. Munson and L.R. Hanning June 18, 1968. This is a new county record. (Munson).

GREEN PEACH APHID (*Myzus persicae*) - CALIFORNIA - Heavy on alfalfa in Holtville, Imperial County. (Cal. Coop. Rpt.).

PEA APHID (*Acyrthosiphon psium*) - NEW MEXICO - Very light in alfalfa in Chaves and Eddy Counties. (Mathews).

PALE WESTERN CUTWORM (*Agrotis orthogonia*) - KANSAS - None found in wheat checked in Barton, Stafford, Edwards, Ford, Meade, Seward, Stevens, Grant, Kearny, Finney, Wichita, Wallace, Logan, Gove, Thomas, Sheridan, and Graham Counties. (Simpson).

SUGARBEETS

BEET ARMYWORM (*Spodoptera exigua*) - ARIZONA - Larvae very light in most Salt River Valley fields in Maricopa County. (Ariz. Coop. Sur.).

GREEN PEACH APHID (*Myzus persicae*) - ARIZONA - Winged adults very light in most Salt River Valley fields in Maricopa County. (Ariz. Coop. Sur.).

MISCELLANEOUS FIELD CROPS

GREEN PEACH APHID (*Myzus persicae*) - ARIZONA - Building up on young safflower in Ocotillo area, Maricopa County. (Ariz. Coop. Sur.).

DECIDUOUS FRUITS AND NUTS

WESTERN PEACH TREE BORER (*Sanninoidea exitiosa graefi*) - CALIFORNIA - Medium in Bing cherry trees in San Jose, Santa Clara County. (Cal. Coop. Rpt.).

WOOLLY APPLE APHID (*Eriosoma lanigerum*) - ALABAMA - Heavy on root systems of 1 to 3-year-old dwarf apple trees in Lee County. (Barwood).

CITRUS

CITRUS FLAT MITE (*Brevipalpus lewisi*) - ARIZONA - This species and *Eotetranychus yumensis* (Yuma spider mite) found in groves in Yuma area of Yuma County. Controls recommended. (Ariz. Coop. Sur., Feb. 5).

CITRUS RED MITE (*Panonychus citri*) - ARIZONA - Heavy on lemon trees in groves on Yuma Mesa, Yuma County. Controls recommended. (Ariz. Coop. Sur., Feb. 5).

COTTONY-CUSHION SCALE (*Icerya purchasi*) - ARIZONA - Moderate in grove at Yuma, Yuma County. Controlled by natural buildup of *Rodolia cardinalis* (vedalia). (Ariz. Coop. Sur., Feb. 5).

ORNAMENTALS

A PIT SCALE (*Cerococcus deklei*) - FLORIDA - All stages moderate on 2,900 hibiscus plants at a nursery in South Miami, Dade County. (Dillon, Feb. 4). Light on 1,215 hibiscus at a nursery in Miami. (Dillon, Feb. 5).

WHITE PEACH SCALE (*Pseudaulacaspis pentagona*) - ALABAMA - Very heavy on Chinese privet in Lee, Dallas, Colbert and other counties. (Leeper, Feb. 7).

A MEALYBUG (*Antonina pretiosa*) - CALIFORNIA - This species and *Odonaspis penicillata* (an armored scale) heavy on bamboo nursery stock in San Jose, Santa Clara County. (Cal. Coop. Rpt.).

FOREST AND SHADE TREES

PALES WEEVIL (*Hylobius pales*) - ALABAMA - Adults feeding on 1 to 2-year-old pines in 10 to 15-acre planting in northwest Chambers County. (Barwood).

SILVER-SPOTTED TIGER MOTH (*Halisidota argentata*) - CALIFORNIA - Larvae damaging pine trees in Pacific Grove, Monterey County. (Cal. Coop. Rpt.).

MAN AND ANIMALS

SCREW-WORM (*Cochliomyia hominivorax*) - One case reported in U.S. February 9-15 as follows: TEXAS - Bee County. Total of 148 cases reported in portion of Barrier Zone in Republic of Mexico February 3-8 as follows: Sonora 67, Chihuahua 2, Coahuila 5, Nuevo Leon 6, Tamaulipas 68. Total of 2 cases reported in Mexico south of Barrier Zone. Barrier Zone is area where eradication operation underway to prevent establishment of self-sustaining population in U.S. Sterile screw-worm flies released: Texas 2,168,000; Mexico 49,600,000. (Anim. Health Div.).

COMMON CATTLE GRUB (*Hypoderma lineatum*) - ALABAMA - Emergence expected in February and March. Infestation ranged 10-15 percent in one Sumter County range herd; grubs 4-10 per cow. Grubs ranged 2-4 per head in 2 percent of breeding stock at Lee County sale. (Anderson). OKLAHOMA - Averaged 4 per head on cattle in Payne County. Light in Mayes County. (Okla. Coop. Sur.). ILLINOIS - Found 105 grubs on native cattle in west-southwest district. In third to fifth instar. (Ill. Ins. Rpt.).

MOSQUITOES - MISSISSIPPI - *Culiseta inornata*, *Anopheles crucians*, *Culex salinarius*, *C. restuans*, *C. territans*, *Aedes sollicitans*, and *A. mitchellae* collected in Hancock County. *Culiseta inornata* most numerous. (Dinkins). ALABAMA - *Culex pipiens quinquefasciatus* (southern house mosquito) active as result of warming trend past 15-20 days; egg laying occurred. Larvae light near homes. (Barwood).

CATTLE LICE - OKLAHOMA - *Haematopinus eurysternus* (short-nosed cattle louse) moderate, up to 1 per hair part, on cattle in Payne and Noble Counties. *Bovicola bovis* (cattle biting louse) present in Noble County. (Okla. Coop. Sur.). MISSISSIPPI - *Linognathus vituli* (long-nosed cattle louse) heavy on 60 head of beef cattle in Oktibbeha County. (Dinkins).

HOG LOUSE (*Haematopinus suis*) - OKLAHOMA - Moderate on hogs in Mayes County. (Okla. Coop. Sur.).

WINTER TICK (*Dermacentor albipictus*) - OKLAHOMA - Moderate to heavy on elk at Wichita Mountains Wildlife Refuge, Comanche County. (Okla. Coop. Sur.).

HOUSEHOLDS AND STRUCTURES

EUROPEAN EARWIG (Forficula auricularia) - MICHIGAN - Found in Ishpeming, Marquette County. (Janes). This is a new county record. (PPC).

STORED PRODUCTS

RICE WEEVIL (Sitophilus oryzae) - CALIFORNIA - This weevil, Tribolium castaneum (red flour beetle), and Rhyzopertha dominica (lesser grain borer) heavy in stored grain in Bakersfield, Kern County. (Cal. Coop. Rpt.).

A DERMESTID BEETLE (Trogoderma parabile) - CALIFORNIA - Larvae heavy in tomato and barley seed in Brawley, Imperial County. (Cal. Coop. Rpt.).

CONFUSED FLOUR BEETLE (Tribolium confusum) - NEW MEXICO - This species and Oryzaephilus surinamensis (saw-toothed grain beetle) light in stored grain products and feeds in Hidalgo County. (Hare).

BENEFICIAL INSECTS

A DAMSEL BUG (Nabis ferus) - ARIZONA - This and Chrysopa spp. (green lacewings) averaged 10 per 100 sweeps on alfalfa in Salt River Valley. (Ariz. Coop. Sur.).

FEDERAL AND STATE PLANT PROTECTION PROGRAMS

IMPORTED FIRE ANT (Solenopsis saevissima richteri) - ALABAMA - Winged forms in all mounds in central and southern areas. Males observed in flight past 15 days. (Andrews, Barwood).

HAWAII INSECT REPORT

General Vegetables - CARMINE SPIDER MITE (Tetranychus cinnabarinus) buildup on snap beans and eggplants at Waianae, Oahu; severe in many snap bean fields. Light on snap beans at Waimanalo. (Nakao, Funasaki). SWEETPOTATO VINE BORER (Omphisa anastomosalis) larvae heavy, damage severe to 3-month-old sweetpotato vines in 2.75-acre field at Waimanalo, Oahu. (Sato, Funasaki). GREEN PEACH APHID (Myzus persicae) severe on eggplant at Punaluu, Oahu. Rains hampered sprays. Many adults parasitized by a braconid. (Funasaki). BEAN FLY (Melanagromyza phaseoli) larvae medium, damaged 25 percent of snap bean seedlings at Pukalani, Maui. Negligible to trace in most snap bean fields on Oahu; medium, caused stunting of one-month-old plants in field at Waimanalo. (Miyahira, Funasaki). IMPORTED CABBAGEWORM (Pieris rapae) eggs and adults light on head cabbage at Pulehu, Maui. All stages light on head cabbage at Kaaawa and Kipapa, on broccoli at Pupukea, on mustard cabbage at Waimanalo and Waianae, Oahu. (Miyahira et al.). ONION THRIPS (Thrips tabaci) adults light on onions at Pulehu and Omapio, Maui. (Miyahira).

Beneficial Insects - SOUTH AFRICAN EMEX WEEVIL (Apion antiquum) larvae and adults light on young emex plants at Pulehu and Omapio, Maui. (Miyahira).

Miscellaneous Insects - Nymphs and adults of a RHOPALID BUG (Jadera haematoloma) remain light to moderate on balloonvine on southwest and west Oahu. (Nakao). Nymphs and adults of a GRASSHOPPER (Oedaleus abruptus) light and reinfesting 30 percent of previously treated areas at Hickam Air Force Base, Honolulu, Oahu. (Olson).

INSECT DETECTION

New County Records

NORTHERN CORN ROOTWORM (Diabrotica longicornis) - MARYLAND - Collected in blacklight trap at Friendship Airport, Anne Arundel County, August 14, 1968. Determined by J.L. Hellman. This is a new county record. (U. Md., Ent. Dept.).

CLOVER SEED WEEVIL (Miccotrogus picirostris) - MISSOURI - Crawford County. (p. 108).

EUROPEAN EARWIG (Forficula auricularia) - MICHIGAN - Marquette County. (p. 110).

CORRECTIONS

CEIR 19(5):66 - Distribution of Old-house Borer - As record for Wisconsin is in error it should be deleted.

CEIR 19(7):101 - IMPORTED FIRE ANT (Solenopsis saevissima richteri) - Third line from bottom of paragraph should read ... 604 thousand in Louisiana, ...

LIGHT TRAP COLLECTIONS

FLORIDA - Gainesville - 2/7-13, BL - Armyworm (Pseudaletia unipuncta) 1, black cutworm (Agrotis ipsilon) 2, granulate cutworm (Feltia subterranea) 15; 2/9-13, BL - Armyworm 3, black cutworm 8, granulate cutworm 23.

WEATHER OF THE WEEK ENDING FEBRUARY 17

HIGHLIGHTS: A warming trend occurred over the West and a cooling trend over the East. A wide variety of severe weather occurred from the central and southern Great Plains to the southern Appalachians.

PRECIPITATION: One of the fiercest storms in a decade tapered off Monday afternoon, February 10, after leaving 1-2 feet of snow over parts of the Northeast. A less intense storm produced light snow over Michigan and nearby States in the first part of the week. A Pacific storm dumped heavy rain along the coast and in some of the interior valleys with heavy snow in the Cascades and northern Sierras with light snow flurries across the northern States to the western Great Plains. Shortly after midweek, warm moist air from the western end of the Gulf of Mexico spread northward into a low pressure area in the West producing generous rain over southern Texas, freezing rain and snow from northern Texas to Kansas, and heavy snow in the central and southern Rocky Mountains. The snow moved eastward late Thursday to Nebraska, Kansas, Iowa, and northern Missouri. By Friday showers and thunderstorms occurred over much of the Southeast while snow continued in the northern Great Plains, spreading to the Dakotas and western Minnesota. Snow continued in the northern and central Great Plains over the weekend with accumulations in central Nebraska and central Kansas ranging up to 14 inches in some places. Snow depths at the end of the week ranged 2-4 feet in eastern South Dakota and west-central Minnesota. Freezing rain fell from north-central Texas to Georgia while moderate to heavy snow fell from Kansas to the southern Appalachians. By Sunday morning snow depths reached 8 inches or more in spots in Kansas, southern Missouri, northern Arkansas, Kentucky, and western North Carolina. Freezing rain occurred in the Piedmont in the Carolinas.

TEMPERATURE: A warming trend brought temperature above normal over most of the West. Most of Wyoming averaged 6°-9° above normal after a relatively cold week. Northerly winds brought lower temperatures to most of the East with large areas in the Southeast averaging 6° to 10° cooler than normal. A vigorous cold front dropped the temperatures sharply in Texas ending a mild spell in that State. (Summary supplied by Environmental Data Service, ESSA.)

POPULATIONS OF THE NORTHERN CORN ROOTWORM, *Diabrotica longicornis* (Say)

The northern corn rootworm is a serious pest of growing corn in many areas. The most important damage is caused by the narrow, elongate, whitish larva which feeds in or on the surface of the roots, thus weakening the root support and reducing the vigor of the plant. Larvae feed on roots from early June through August, but the most important damage occurs from mid-June until mid-July. As far as is known, the larvae feed on corn roots only, and if corn is not present when the larvae hatch they will die. The adult, about one-fourth inch in length, is a dull greenish or dull yellowish beetle. It feeds on corn silks and pollen, or often leaves cornfields and feeds on pollen of various plants such as alfalfa, sweetclover, milo, and weeds. The beetles sometimes congregate and feed on fresh corn silks, resulting in ears with few kernels. Eggs of this beetle are deposited in the soil throughout the summer until frost; one female may deposit about 300 eggs. The egg is the overwintering stage.

This species in the United States consists of three separate populations distinguishable as adults by the color differences and distribution given below. The western population, *Diabrotica longicornis longicornis* (Say), ranges from North Dakota south to Texas and to Arizona (see map). The midwestern population, *D. longicornis barberi* Smith and Lawrence, is found from the Plains States to Eastern United States. The color of the appendages of this population is lighter than that of the other two. The eastern population of *D. longicornis* (not yet given a name) is found from northern Georgia northeast to New England. This population is similar in color to *D. l. longicornis*. Specimens collected from areas in which two populations overlap are often difficult to name with certainty. An approximation of the distribution of the three populations is given on the map; the collection records are from specimens in the U. S. National Museum.

Key to Populations of *Diabrotica longicornis*

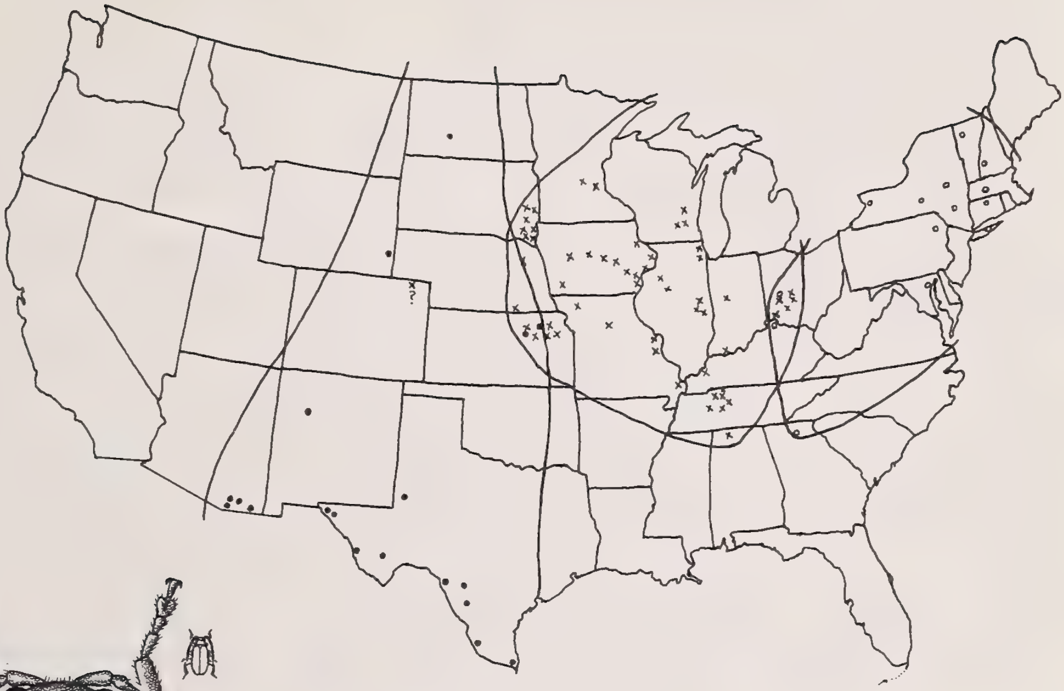
1. Tibiae, tarsi, antennae, and clypeus light or but slightly darker than rest of body; South Dakota to Kansas east to Tennessee and Ohio..............................*longicornis barberi*

   Tibiae, tarsi, antennae (except basal segments), and clypeus brownish to black; Plains States to Texas and Arizona, or Northeastern States..2

2. Occurring west of the Mississippi River; often with head black and elytra striped.......................*longicornis longicornis*

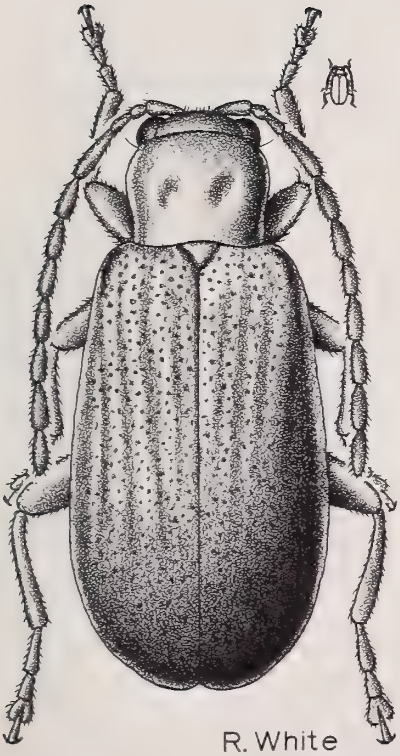
   Occurring east of the Mississippi River; head never black, elytra never striped..................*longicornis*, eastern population

Illustration and map on following page.



DISTRIBUTION OF POPULATIONS

• = D. l. longicornis (Say)
× = D. l. barberi S. & L.
∘ = D. l., eastern population



R. White

Diabrotica longicornis barberi Smith & Lawrence
(small figure actual size)

Richard E. White
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Washington, D. C.

U.S. Dept. Agr.
Coop. Econ. Ins. Rpt.
19(8):112-113, 1969

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1968

(continued from page 104)

SPECIAL INSECTS OF REGIONAL SIGNIFICANCE

Highlights:

GREENBUG occurred in outbreak proportions in several Midwest and Southwest States during 1968. Over one million acres of sorghum were heavily damaged in Kansas with the total loss placed at about $12,000,000. The loss in Nebraska was about $3,500,000 and approximately 3 million acres were involved in the outbreak on the High Plains of Texas. This aphid also damaged small grains in several States. Greenbug was found for the first time in Nevada during 1968. CORN LEAF APHID populations were heavier in Illinois than in 1967 but not as severe as in 1966. This aphid was heavy in several other States with some damage reported. A SPOTTED ALFALFA APHID outbreak developed on alfalfa in west-central Utah in mid-July where damage was greater than in 1967 but less than in 1966. Some damage was reported in other States. POTATO LEAFHOPPER damaged soybeans statewide in Maryland and alfalfa in highland areas of Virginia. Populations were higher than normal in Minnesota but damage was low. BEET LEAFHOPPER was severe in some isolated sugarbeet areas of California and killed tomatoes in southern Utah. This pest caused some local problems in western Idaho. ARMYWORM adult flights early in the season in Indiana were the heaviest in 5 years. CORN EARWORM caused serious damage to sweet corn in northeastern Oregon and was severe on corn statewide in California. Population buildup in corn was heavy in eastern and southern Nebraska in August, and much heavier in Kansas than last year. Corn earworm was the major pest of soybeans in Arkansas and southern Alabama and a serious pest of tobacco in Alabama. TOBACCO BUDWORM was a major pest of tobacco in Florida and Alabama. ARMY CUTWORM populations were the heaviest and most widespread in Nevada since 1961 and damaged several crops in Idaho. This pest was economic on wheat and alfalfa in northeastern Wyoming and damaged small grains in Texas and wheat in northwestern Kansas and southwestern Nebraska.

GREENBUG (*Schizaphis graminum*) was severe on sorghum in Colusa, Glenn, Tulare, Fresno, and Imperial Counties, CALIFORNIA. Late in the season it infested barley in Fresno County. In Nye County, NEVADA, one alate was collected on corn in June 1968 and reported as a new State record in 1969; one apterous specimen was collected from sorghum in November, and light numbers developed on barley in October in the same county. Heavy numbers developed on barley in Clark County; this was a new county record. This pest occurred in outbreak numbers on 800 acres of sorghum in Washington County, UTAH. Small grain was lightly infested. Numbers in ARIZONA ranged light to heavy on sorghum in Cochise County during August and September. Injury was severe in many fields; controls were applied. Counts ranged from zero to over 2,000 per row foot on wheat in Curry and Roosevelt Counties, NEW MEXICO, during early spring. Numbers were especially heavy at the Rogers and Causey area, Roosevelt County. This aphid damaged approximately 250,000 acres of grain sorghum in the State. Yield losses ranged from less than 100 to over 2,000 pounds per acre. A major outbreak occurred in eastern COLORADO in late July and early August. Losses were very light in the northeastern area, but ranged moderate to heavy in the Arkansas Valley. Extensive controls were applied in the Arkansas Valley and as far north as southern Yuma County. The greenbug moved into and killed wheat emerging before September 1. After that date, populations remained light on emerging wheat in the Arkansas Valley. Numbers in WYOMING were low during spring with no damage to wheat. Parasites and predators were heavy.

Greenbug was the major economic insect on sorghum and related crops in SOUTH DAKOTA in 1968. In the first week of August damage was noted on sorghum, Sudan, and sorghum-Sudan crosses in one east-central and 3 southeastern counties. From 4,500 to 5,000 aphids per plant infested some sorghum. Predators were light. During the last week of August, populations were economic on sorghum in areas of

1 northeastern and 2 south-central counties. Controls were applied. In mid-October greenbug killed several acres of winter wheat in eastern Haakon County. Later in the month, the pest increased in eastern Meade and Haakon Counties, but remained noneconomic. It increased to economic levels in eastern Pennington County. where over 900 acres of wheat were treated. By the end of the first week of November, economic numbers and severe damage had been reported from 2 west-central and 6 central South Dakota counties. Aerial sprays continued through most of November. Winter loss of untreated wheat may total several thousand acres. If the 1968 trend of infestations continues into 1969, damaging numbers are likely on sorghum and small grains in summer and fall of 1969. Migrants entered MINNESOTA in early April; numbers were moderate with no observed damage to field crops. Numbers in IOWA remained low on wheat in the spring. Damage was minor on small grains and also on sorghum in localized southwestern and western areas. Light numbers were present in the spring and fall on early planted wheat in MISSOURI. A few fall wheat fields were treated in the northwestern area where greenbug had infested sorghum during summer. In south-central NEBRASKA overwintering greenbugs were not detected early in the year on wheat which had been heavily infested in the fall of 1967. On May 20 the first damage to seedling sorghum was reported. During the period July 12-26 increase was heavy on most sorghum; 2,000-3,500 per leaf were reported. Damage to grain sorghum was estimated at $3,500,000 in Nebraska. In August numbers declined sharply in the eastern area and had nearly disappeared in the southwestern and panhandle areas. This decline was due mostly to parasites and predators. In August and September some rye was damaged in central Nebraska. In late September greenbug was first observed on winter wheat in the southeastern area; some controls were needed in the northwestern panhandle on winter wheat and on small grains in the northern panhandle. Heavy numbers were found in northeastern KANSAS in mid-July on sorghum and in most western areas within 2 weeks. The southeastern area and a north to south strip through the center of the State escaped severe damage. Over one million acres were severely infested and 600,000 acres were treated. Total sorghum loss was placed at about $12,000,000. By late August parasites and predators reduced populations in most areas to trace amounts. Light numbers in most wheatfields during fall did not reach economic levels.

Greenbug increased on wheat during March and the first half of April over most of OKLAHOMA. The highest numbers (200-500 per row foot) occurred in the southwestern and panhandle districts and in scattered areas of the northwestern, west-central, and north-central districts. In late July greenbug was first noted on sorghum in the southwestern and south-central areas. During August up to 1,500 per leaf infested broomcorn and killed sorghum in south-central, southwestern, west-central, northwestern, and panhandle areas. Parasites and predators were mainly responsible for decreases. In early November and in mid-December occasional wheatfields in southwestern, northwestern, and north-central areas carried 50-80 per foot. In most areas of TEXAS cold weather reduced greenbug activity on small grains during early January. During late March moderate to heavy numbers were noted in some Rolling Plains counties. Up to 2,000 per foot infested small grains in Foard, Hale, and Hemphill Counties. Some counties in the panhandle had to apply controls. This pest was heaviest on small grains in areas of Armstrong and Carson Counties. The first economic buildup of greenbug on grain sorghum in Texas involved approximately 3 million acres on the High Plains during July and August. About half of this acreage was sprayed. Greenbug was economic in only a few grain fields in ARKANSAS. Numbers were generally light and parasitism was heavy. In ALABAMA greenbug damaged small grains mainly in Mobile and Baldwin Counties.

CORN LEAF APHID (Rhopalosiphum maidis) was heavy throughout ALABAMA, especially in the northwestern area; maize dwarf mosaic virus also appeared throughout the northwestern area. Numbers in ARKANSAS on corn and sorghum were lighter in 1968 than in 1967. This pest was heavy on sorghum, corn, and broomcorn in northeastern OKLAHOMA during late June and July and in the southwestern and panhandle areas during August. Not until early November did heavy numbers infest small grains in a few northwestern and west-central counties. Heavy numbers in southern and south-central TEXAS damaged corn and grain sorghum during mid-April and May; some fields had to be replanted.

Corn leaf aphid was light on barley in the Pecos Valley of New Mexico in January and February and did not appear on corn and grain sorghum until summer. Infestations in ARIZONA ranged moderate to heavy on sorghum in Cochise, Graham, and Yuma Counties from May through October; many fields required treatments. Numbers were heavy on barley from mid-March through April in Yuma County and during mid-May on barley in the boot stage at Kansas Settlement, Cochise County. Damage was heavy in various CALIFORNIA locations on barley and oats. Controls in NEVADA were required in Pershing County in June. In October light to medium populations developed on barley in Clark County and were heavy in southern Nye County. In UTAH corn leaf aphid was heavier than greenbug on 800 acres of barley in Washington County. Infestations of spring barley were noticeable in several counties. Several thousand acres of barley in Millard County were aerially sprayed. Corn in eastern COLORADO required controls. In WYOMING corn leaf aphid was moderate on about 20 percent of the corn in the southeastern area, but light elsewhere. This aphid was first noted on July 30 but began to decline about mid-August. Parasites and predators held it in check.

Corn leaf aphid was common on corn and sorghum in some fields in southeastern SOUTH DAKOTA the last week of July. Predators were present in all fields and kept populations in check. The buildup on sorghum in NEBRASKA began in mid-June in the eastern district and peaked in the second week of July. Some damage occurred and then populations declined. On corn numbers peaked and declined in the last half of July with little damage. On winter wheat populations of Rhopalosiphum maidis and R. fitchii (apple grain aphid) up to 350 per row foot in September and October caused little damage; R. fitchii was predominant. In KANSAS corn leaf aphid was heavy on corn and sorghum in late June and early July with some damage to young plants. In central IOWA it was active in some barley without causing damage. Populations in ILLINOIS were much higher than in 1967 but not as severe as in 1966. During the last of July and first of August, the State average rating was 3 (1 is no aphids; 10, heavily infested); the central district had the highest rating with 5. Adequate rainfall prevented severe damage in most areas. A survey of 22 severely infested fields revealed 8 percent of plants heavily infested, 8 percent moderate, 33 percent light, and 51 percent clean. The first corn leaf aphid adults in WISCONSIN were noted on sweet corn by July 5. Colonies of 500 or more per plant were rare. Weather, lady beetles, syrphid flies, and Orius insidiosus (a flower bug) controlled this pest. Corn leaf aphid increased noticeably where controls had been applied for Ostrinia nubilalis (European corn borer). The early appearance of Empusa fungus kept corn leaf aphid populations in MICHIGAN below the levels of 1967. This aphid was the major corn pest in INDIANA for the second straight year. While remaining light throughout the season in the southern districts, numbers built up in the central and northern districts in mid-July. By early August all corn that had not tasselled was 100 percent infested. Infestations in the northern half of the State were light on 43 percent of the corn, moderate on 10 percent, and heavy on 6 percent. Statewide, there was a 27 percent reduction in total infestations compared with 1967. Corn leaf aphid increased rapidly on corn and sorghum in OHIO from mid-July into August, but numbers on corn were not significant and few infestations were reported.

Corn leaf aphid ranged light to heavy in VIRGINIA during July and August, but damage was light in most areas. The first significant buildup on corn in MARYLAND occurred during mid-July. By early August this aphid had infested 20-100 percent of most fields. Some fields on the lower Eastern Shore required controls, but numbers generally ranged light to moderate. Warm, humid weather during late July in PENNSYLVANIA favored an injurious buildup in a few cornfields, especially in the eastern half of the State. Heavy numbers infested 20-50 percent of the stalks in many fields. In NEW HAMPSHIRE moderate to heavy numbers infested field and sweet corn from late July; sooty fungus infected husks.

SPOTTED ALFALFA APHID (Therioaphis maculata) was not found until mid-September in OREGON when counts in alfalfa ranged up to 50 per sweep. No damage was evident. Populations in CALIFORNIA also built up late in the year but were lower than normal. Although light in southern NEVADA, this aphid required controls in southern Nye County in March. High numbers in ARIZONA infested several fields of alfalfa in Yuma County in March, July, August, November, and December. From October to December alfalfa was badly damaged in the Mesa and Perryville areas in the Salt River Valley. An outbreak on alfalfa developed in UTAH north of Delta on about July 20 and spread rapidly throughout western Millard County; damage was greater than in 1967 but less than in the outbreak of 1966 when control was difficult. Otherwise, the infestation was light statewide. Activity in IDAHO was observed on seedling alfalfa in a field near Parma County, October 2; counts of 1-2 per true leaf had killed 10 percent and severely weakened 40 percent of the plants. In WYOMING spotted alfalfa aphid was collected in Big Horn County for a new county record. The highest counts, 150 per 100 sweeps, were noted in Goshen County. Populations ranged light to moderate in the Arkansas Valley of COLORADO.

Spotted alfalfa aphid was light to heavy on alfalfa in Foard and Ward Counties, TEXAS. Counts ranged light to medium over most of OKLAHOMA from late March through November. Over 200 per 10 sweeps were reported from the southwestern area in mid-April and early August, the west-central area in mid-August, the central area in late August, and the north-central area in mid-November. The buildup in ARKANSAS began in early February. Highest counts reached 500 in 100 sweeps from July to October. Populations declined in October. Few infestations were economic.

Spotted alfalfa aphid remained low on alfalfa in KANSAS throughout summer and fall with little damage. In NEBRASKA the pest first appeared April 19 in Otoe County. In late August counts reached 880 per square foot in some alfalfa. Seedling alfalfa was seriously injured in Dawson County. By mid-September numbers declined. The first damaging populations in SOUTH DAKOTA occurred east of Yankton, Yankton County, in mid-August. During the first week of October 150-200 aphids per 100 sweeps infested small areas of green alfalfa 7-9 inches high east of Spearfish, Lawrence County. Day, Grant, Roberts, Edmunds, Hyde, and Faulk Counties were reported as new county records in mid-September. This aphid was not collected in IOWA in 1968. No buildups occurred in INDIANA, reflecting the abundant moisture present throughout the growing season. In VIRGINIA spotted alfalfa aphid was damaging in only a few widely scattered fields of alfalfa.

POTATO LEAFHOPPER (Empoasca fabae) adults infested potatoes in RHODE ISLAND by August 26. In PENNSYLVANIA the damaging numbers of 1967 did not develop on forage. Most damage occurred in the western area during summer. This leafhopper was present on lima beans in DELAWARE during June and was abundant in most areas by July and August. The buildup on alfalfa in MARYLAND began the second week of July and rapidly peaked the first week of August. Peaks ranged 7-30 per sweep on the Eastern Shore and 4-75 per sweep in the central area. Statewide, populations ranged light to moderate. Several hundred acres of alfalfa showed typical "hopperburn" or yellowing. This leafhopper caused moderate to heavy damage to 150 acres of snap beans and to soybeans statewide. Light numbers infested potatoes and occasionally yellowed forage severely in the highlands of VIRGINIA.

Potato leafhopper was migrating into OHIO in mid-May. By late July yellowing of second-growth alfalfa was evident statewide. Counts ranged up to 52 per sweep, but generally averaged 10 or less. Through July and into August adequate rains apparently prevented much of the widespread damage of 1967. Populations on alfalfa in INDIANA were relatively high throughout the season. Growing conditions prevented yellowing of alfalfa except in the south-central district during mid-June. Counts reached highs of 1-8 per sweep during mid-May, 3-23 per sweep during late June, and 3-29 per sweep during early August statewide. Problems on forage in MICHIGAN did not warrant extensive controls. Adults of potato leafhopper increased on alfalfa and potatoes about June 28 in WISCONSIN. In the first half of July nymphs appeared on potatoes and alfalfa, and adults became apparent on snap and lima beans. Numbers rarely exceeded 10 per sweep. In October, 25 per sweep was common in some alfalfa in southern Wisconsin. Migrants entered MINNESOTA earlier than normal and were found in the southeastern district on April 30. Numbers throughout the season were higher than normal, but little damage was noted on potatoes or alfalfa. In southern ILLINOIS potato leafhopper was first found the week of May 3. Lower than normal, counts ranged from less than 100 to a maximum of 1,200 per sweep; the State average was 313 per 100 sweeps. Numbers built up in June with no severe damage. Throughout MISSOURI, populations of this leafhopper were moderate to high (10-90 per 10 sweeps) on alfalfa. Infestations were reported in late June and during July. Damage could be found over most of Missouri.

BEET LEAFHOPPER (*Circulifer tenellus*) controls were applied in spring, fall, and winter to rangelands and Russian-thistle stands in CALIFORNIA. It was very severe in a few isolated sugarbeet areas; many fields required treatment. Curly top virus was very low and sugar content above average. In San Diego County beet leafhopper damaged cucumbers and squash. Virus infection in tomatoes and melons was less than 1 percent. Beet leafhopper was heavy in many fields at Casa Grande in Pinal County, ARIZONA, in mid-June and ranged moderate to heavy in Cochise County from late June through mid-July and in mid-October. In UTAH numbers and curly top damage on sugarbeets ranged light to moderate. In the southern area this pest and the virus killed 20-90 percent of the tomatoes and reduced yields of table beets, spinach, cucumbers, and beans. Losses due to this leafhopper ranged light to moderate on sugarbeets on the Western Slope of COLORADO. In WYOMING curly top damage on beets was light. Weed host areas in the Worland Valley of Big Horn and Washakie Counties carried 0.35 leafhoppers per square foot April 9-10. Approximately 6,800 acres of wasteland were treated. On May 9, weed hosts carried 0.09 per square foot. In central IDAHO overwintering adults averaged 42 per 100 samples (22 per 100 samples in 1967) in range breeding areas during March and April. Movement in the western area caused some localized trouble. On April 27 the first adults of the season were observed in the Saylor Creek and Shoshone Falls area, but they may have been blown in. Because of a dry April, hatching was rapid in spite of intermittent freezing temperatures. Prior to treatment, nymphs ranged 35-60 per square foot and more were appearing. On May 17 spraying was initiated on 13,500 acres of rangeland in Idaho. The initial movement of beet leafhopper from rangeland had started by May 19.

ASTER LEAFHOPPER (*Macrosteles fascifrons*) infested celery in San Luis Obispo County, CALIFORNIA. Losses on lettuce were light in COLORADO except in Pueblo County where losses ranged moderate to heavy due to aster yellows virus. Numbers in IOWA were not economic on forage legumes. Migrants entered MINNESOTA in early April. Moderate numbers caused no observed damage to field crops. Aster yellows was at a low level during the season in flax and potatoes. Aster leafhopper entered WISCONSIN by April 19 when up to 5 per 100 sweeps were detected on rye in Sauk, Trempealeau, and Marquette Counties. Late in May, 3-6 per 100 sweeps were common in oats; late in June, 10 per 100 sweeps was average. In mid-June aster yellows became apparent in lettuce. Routine controls minimized virus problems in Wisconsin.

POTATO PSYLLID (*Paratrioza cockerelli*) was mostly a greenhouse pest of potatoes in CALIFORNIA, with a few infestations in San Diego County pepper fields. Low numbers infested potatoes and tomatoes in UTAH and caused light to moderate losses to potatoes in COLORADO. Most potatoes in WYOMING which were treated at planting time with systemic insecticides and with timely applications of contact insecticides showed only slight damage from psyllid yellows disease. Adults were first found on *Lycium* sp. June 24 in Goshen County.

ARMYWORM (*Pseudaletia unipuncta*) recurred as a lawn pest in CALIFORNIA. Larvae caused damage in TEXAS. In OKLAHOMA damage on wheat was heavy during late May in Cotton County. Numbers on small grains were lighter in ARKANSAS in 1968 than in 1967. A few fields were treated in the northeastern area where counts up to 10 per square foot occurred in late May. In TENNESSEE larvae ranged 15-20 per square foot on small grains in 4 far western counties during early May. Armyworm was not a problem in KANSAS. In southeastern MISSOURI most heavy infestations occurred in dense stands of wheat and barley. Adults in light traps in IOWA were light throughout the season. In MINNESOTA economic numbers of 5 or more larvae per row foot infested a limited area of 5 south-westcentral counties in July. Barley, especially lodged fields, had the highest counts; wheat, oats, rye, and corn were also damaged. Some spraying was needed in all infested counties. Rapidly maturing small grain made controls impractical. Adults appeared in blacklight traps by May 1 in Dane and Waushara Counties, WISCONSIN. Flights were constant until late July when a mild peak occurred. Damage to corn and oats was minor. Numbers were relatively low in ILLINOIS, but were highest in the southwestern district. Larvae averaged 2.4 per foot in thick stands of wheat in one county. High temperatures and parasites controlled migrations to a few grassy cornfields. In INDIANA the early season flight was the heaviest in 5 years. Flights peaked May 1-7 when 1,301 moths were caught in a blacklight trap in Gibson County. Very cool, moist conditions during May produced lush grass and inhibited armyworm development. Moths appeared April 28 in southern MICHIGAN. By May 14-15, warm temperatures produced counts of 178 adults; however, larval outbreaks were relatively light. Generally, problems in wheat and other cereal crops were less than in the past 2-3 years. Weekly counts in late June and mid-July averaged about 150 per light trap. Adults were still active in early November. Armyworm was severe in many locations of the VIRGINIA highlands, mainly on sod-planted corn. Numbers in MARYLAND were well below normal on small grains and corn. Very little treatment was made.

CORN EARWORM (Heliothis zea) moths were about twice as numerous as in 1967 in the Wapato area of Yakima County, WASHINGTON; one light trap averaged 191 moths per night from July 30 to August 5. Damage in OREGON was serious on sweet corn in Umatilla County. In early June larvae destroyed tassels and leaves of young corn. Larvae damaged more than the usual amount of ears later in the season. In CALIFORNIA larvae were severe on corn statewide from May through December. Widespread on many vegetables, larvae damaged field beans and lima beans in San Diego County. Larvae were light on corn during June and moderate on corn and sorghum during August in Graham County, ARIZONA. In late June a cornfield was 20 percent infested at Yuma, Yuma County. In early October larvae were heavy on field corn at Chino Valley, Yavapai County. Larvae were light to moderate on canning, market, and garden corn in the central and northern areas of UTAH and heavier in the southern area. In eastern COLORADO larvae of H. zea and Diabrotica virgifera (western corn rootworm) ranged moderate to heavy on corn; loss was moderate. Larvae infested nearly all ears of early sweet corn in Canyon County, IDAHO. Larvae were damaging in Custer County and were reported in Yellowstone and Rosebud Counties, MONTANA.

In Cass County, NORTH DAKOTA, one corn earworm per plant damaged about half of the sweet corn plants. In a field near Yankton, Yankton County, SOUTH DAKOTA, larvae infested 2 percent of the corn ears. Low counts on field corn in MINNESOTA were found after late July. Canning companies had spotty problems in August and September in some sweet corn fields. Adults were first detected in WISCONSIN at Arlington, Columbia County, August 16. Flight was heavy in the sweet corn growing area during mid-August. Larvae of H. zea and Ostrinia nubilalis (European corn borer) were numerous in sweet corn ears in early September and controls were intensified. Flights into southern MICHIGAN were nearly normal. On August 21 and 22, the first moths were detected in Lenawee County. About a month later, 327 adults were collected at the Berrien County blacklight trap in a single night. Controls were adequate. Populations on field corn remained light in INDIANA. Infestation averaged 4.56 percent for the State, a slight increase over 1967. Corn in the southern quarter of the State had an average infestation of 14 percent and a yield loss of 1 percent. Numbers in central and southern ILLINOIS were very light on sweet corn but were moderate in the processing corn area of the northeastern section. Numbers over most of IOWA remained low and damage remained light in western areas.

Corn earworm was apparent in corn whorls and alfalfa in eastern and southeastern NEBRASKA from mid-June to mid-July. A heavy buildup in August infested 10-80 percent of the ears in these areas. Moderate numbers infested 10-35 percent of the corn in the central and southern districts. Corn earworm was light in less than 1 percent of the corn in the panhandle counties of Nebraska. This pest was much heavier in corn in KANSAS during 1968 than during 1964 and 1967. Larvae were heavy on most corn and many sorghum fields in the east-central and southeastern districts. Corn earworm ranged moderate to heavy on corn over most of OKLAHOMA from mid-June to early October. In late August counts as high as 10 per ear were found in Craig County. In early September up to 5 per grain sorghum head occurred in occasional fields in the northwestern and north-central areas. Numbers were generally light on soybeans and peanuts. Damage was economic on corn and grain sorghum in TEXAS. This major pest of soybeans in ARKANSAS was light compared with some years; relatively few fields were treated. Damage to sorghum heads and sunflowers was not economic. In ALABAMA the first generation infested mostly crimson clover and vetch. Larvae were widespread and damaging to pretassel corn and sorghum and to ear corn in the milk and dough stages. Corn and grain sorghum supported the generations which produced damaging numbers on peanuts, soybeans, cotton, tomatoes, and other crops. Corn earworm was a major pest of soybeans in southern Alabama, but less so in central and northern areas. Damage was less than in 1966 but about the same as in 1967. Mixed populations of Heliothis zea and H. virescens (tobacco budworm) were the most serious tobacco pests; only intensive controls were successful in Alabama. In FLORIDA larvae of H. zea and mostly Spodoptera exigua (fall armyworm) threatened corn throughout the year in the Everglades area, Palm Beach County. During May and early June, 90 percent of ears of untreated sweet corn in Seminole County were free of H. zea. Infestation was lower than in past years. Corn earworm was heavy in fall corn.

Corn earworm infested half of the treated sweet corn ears on the Eastern Shore of VIRGINIA during late August and early September. Larvae ranged light to medium on field corn statewide. Numbers were generally light throughout the soybean belt with a few locally severe pockets. Larvae appeared late in MARYLAND. The first flight was recorded at Centreville, Queen Annes County, on August 15. Damage to corn was below normal with only light infestations on the Eastern Shore and in the central counties. Corn earworm was moderate on corn in RHODE ISLAND and below average in NEW HAMPSHIRE.

TOBACCO BUDWORM (Heliothis virescens) was the major pest on flue-cured and cigar-wrapper tobacco in FLORIDA. Numbers on cigar-wrapper tobacco were lighter than in 1967. Damage ranged moderate to heavy on both types. H. virescens accounted for 5.6 percent of the $1,488,340 insect loss of flue-cured tobacco and for 3.4 percent of the $784,686 insect loss on cigar-wrapper tobacco. In ALABAMA mixed populations of H. virescens and H. zea (corn earworm) were the most serious tobacco pests; only intensive controls were effective. Damaging numbers of both species also infested crimson clover, vetch, peanuts, and soybeans. These crops produced the damaging populations which moved to cotton, corn, sorghum, field peas, and snap beans.

ARMY CUTWORM (Chorizagrotis auxiliaris) damage in NEVADA was heavy on alfalfa in Lincoln County in April and heavy on alfalfa, lawns, and in vegetable gardens in Humboldt and Washoe Counties in May. Larvae were annoying in buildings in some areas in April and May. Numbers were the heaviest and most widespread since 1961. Damage in UTAH was generally light on small grains and scattered in pastures and range forage. During spring, damage was severe on several thousand acres of alfalfa in Wayne County, but was light to moderate elsewhere. This pest was general throughout IDAHO. Up to 24 per square foot infested 100,000 acres of rangeland in Lincoln, Blaine, and Minidoka Counties. Up to 12,000 heavily infested acres required control. Alfalfa, clover, mint, sugarbeets, turnips, and other crops were damaged. Damage was observed in some areas as late as June 20. Army cutworm was abundant in MONTANA east of the Continental Divide. Winter wheat was the major host, but alfalfa, gardens, corn, and beets were also infested. This cutworm was economic on wheat and alfalfa in 2 northeastern WYOMING counties. Spotty infestations on alfalfa in Washakie, Park, Fremont, and Laramie Counties caused some losses. Larvae per square foot averaged 3-4 on wheat and 5-7 on alfalfa in the most heavily infested fields. Adults became numerous in the eastern area about mid-June and were annoying in homes and buildings until the end of June. Army cutworm and Agrotis orthogonia (pale western cutworm) larvae ranged up to 25-30 per foot in some fields in eastern COLORADO. Losses were very high; some fields were replanted. Army cutworm damaged small grains in TEXAS. Infestations on wheat in OKLAHOMA were scattered in the northwestern, west-central, central, and north-central areas from early February to mid-April. Damage was light in most cases. Larvae damaged wheat extensively in the western two-thirds of KANSAS. The heaviest and most extensive infestations occurred in the northwestern area. Larvae damaged alfalfa in many western and south-central areas during spring. Adults were heavier in light traps in southwestern Kansas than for the past few years in September and October.

In southwestern NEBRASKA up to 20 larvae per row foot fed on wheat in late March; damage was moderate and peaked from about mid-April to early May. Damage to alfalfa ranged light to moderate in central, southern, southwestern, and northwestern areas and occurred mostly during March and April. Moth populations in September were higher than in 1967. Army cutworm is expected to increase in Nebraska in 1969. Larvae seriously damaged or destroyed winter wheat throughout western SOUTH DAKOTA. Damage was noticeable by late March and continued to mid-May. Larvae ranged from less than one to seven per row foot. Economic numbers occurred in 11 western counties. Treatment was applied to about 40,000 acres of winter wheat. Controls helped severely damaged fields to recover completely. Larvae seriously damaged alfalfa west of Belle Fourche, Butte County, near Whitewood, Lawrence County, and near Sturgis, Meade County, in late April and early May. Larvae and damage in NORTH DAKOTA appeared in small grains during late April and continued well into June. Cool, damp weather delayed development and pupation. Severe damage, up to 100 percent in some fields, occurred in 4 southwestern counties; infestations were also present in Wells and Bottineau Counties. Damaged fields recovered when controls were applied in time.

PAINTED LADY (Vanessa cardui) flights in ARIZONA were heavy through the Tucson area of Pima County. On April 5, larvae fed heavily on little mallow in northwestern Phoenix, Maricopa County. On April 13-14, flights were heavy at Congress, Hillside, and Bagdad in Yavapai County and at Signal and Wikieup in Mohave County. On May 1-2, flights were heavy in the northern area between House Rock and Marble Canyon State Alternate Highway 89 and south of Flagstaff, Coconino County. Larvae damaged bean plantings locally in CALIFORNIA. They also damaged a wide variety of shrubs. Larvae were more abundant on Canada thistle in Polk County, OREGON, than in 1967. Parasitism appeared lower. Numbers were also abundant on Canada thistle in Umatilla County. Heavy flights were noted in southeastern WYOMING in late May. By June 14, larvae were causing extensive damage to Canada thistle.

Larvae of painted lady damaged isolated fields of soybeans in northeastern KANSAS in late June. Flights through eastern and northeastern NEBRASKA were heavy on May 2. Larvae were unusually abundant on thistles from late May through June. Damage to soybeans was light and scattered. Larvae defoliated thistles in soybean fields in southeastern SOUTH DAKOTA and then moved to the soybeans during the second week of June. Controls were applied in some cases. Larvae were occasionally numerous on Canada thistle in MINNESOTA, and damaged thistle-infested soybeans. In June infestations were scattered throughout the southern area and later in the season could be found northward in the west-central, central, and east-central districts. Canning peas were damaged in some areas. Some soybeans and canning peas were treated. Generally, damage was scattered and confined to individual fields in Minnesota. Larvae of painted lady were pests statewide in IOWA through most of June. After rapidly devouring thistles and cockleburs, larvae moved on to many other hosts including soybeans. Larvae fed on soybeans throughout northern MISSOURI. Small numbers of larvae occurred on sunflower in eastern ARKANSAS in September. In northern INDIANA larval counts ranged 2-8 per plant on half of the thistles checked from mid-May to early June. During the first half of June, migrating larvae damaged soybeans, pastures, and small grains. In most instances damage was restricted to small areas in fields, but some cases of defoliation in up to 6 acres of soybeans occurred.

TOBACCO HORNWORM (Manduca sexta) larvae infested tomatoes in RHODE ISLAND. Some larvae were covered with cocoons of parasitic braconids. In central TENNESSEE a few early instars appeared in tobacco early in June. During summer damage was moderate in most fields because of closely followed spray schedules. Numbers were lower on flue-cured and cigar-wrapper tobacco in FLORIDA. Damage was moderate on flue-cured tobacco and unimportant on cigar-wrapper tobacco. Light trap catches showed a 26-percent decrease compared with 1967. Tomatoes in ARIZONA required treatment in early May at Yuma, Yuma County.

TOMATO HORNWORM (Manduca quinquemaculata) was unusually common on garden tomatoes in Jackson County, OREGON, during summer. Numbers in KANSAS were below normal with little damage.

MELONWORM (Diaphania hyalinata) was serious on cucumbers, cantaloups, and pumpkins in ALABAMA. Larvae partially defoliated a limited planting of Cuban squash at Belle Glade, Palm Beach County, FLORIDA, during October.

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